

1. [Anatomy and Physiology iBook](#)

Anatomy and Physiology iBook

Anatomy and Physiology

J. Gordon Betts and Others

This book is available for download with iBooks on your Mac or iPad, and with iTunes on your computer. Multi-touch books can be read with iBooks on your Mac or iPad. Books with interactive features may work best on an iPad. iBooks on your Mac requires OS X 10.9 or later.

Description

Anatomy and Physiology is a dynamic textbook for the yearlong Human Anatomy and Physiology course taught at most two- and four-year colleges and universities to students majoring in nursing and allied health. A&P is 29 chapters of pedagogically effective learning content, organized by body system, and written at an audience-appropriate level. The lucid text, strategically constructed art, inspiring career features, and links to external learning tools address the critical teaching and learning challenges in the course.

Color is used for pedagogical effect in A&P. Most art will consist of elegant black line, with the strongest line illustrating the most important structure(s) and shading used to show dimension and shape. Color (used only when needed) highlights and clarifies the primary anatomical or functional point of the illustration. Student focus is drawn to the most important learning point in each illustration, without distraction from excessive gradients, shadows, and loud highlights. The online book provides students with links to surgical videos, histology, interactive diagrams, and cadaver imagery at critical junctures.

Screenshots

Unit 2: Support and Movement

Chapter 10 Muscle Tissue

Learning Objectives

- 10.1 Overview of Muscle Tissues
- 10.2 Skeletal Muscle
- 10.3 Muscle Fiber Contraction and Relaxation



527 528 529 530 531 532

6.2 Bone Classification

The 206 bones that compose the adult skeleton are divided into five categories based on their shapes (Figure 6.5). Their shapes and their functions are related such that each categorical shape of bone has a distinct function.

LONG BONES

A **long bone** is one that is cylindrical in shape, being longer than it is wide. Keep in mind, however, that the term describes the shape of a bone, not its size. Long bones are found in the arms (humerus, ulna, radius) and legs (femur, tibia, fibula), as well as in the fingers (metacarpals, phalanges) and toes (metatarsals, phalanges). Long bones function as levers; they move when muscles contract.

SHORT BONES

A **short bone** is one that is cube-like in shape, being approximately equal in length, width, and thickness. The only short bones in the human skeleton are in the carpals of the wrists and the tarsals of the ankles. Short bones provide stability and support as well as some limited motion.

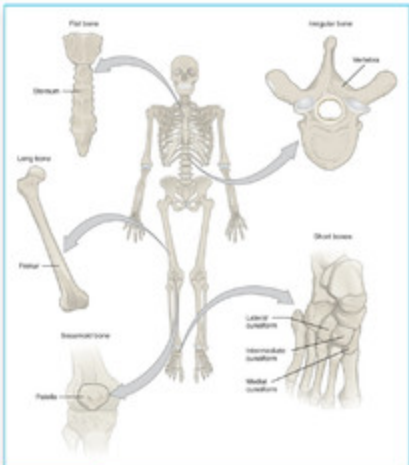


Figure 6.5
Classifications of Bones: Bones are classified according to their shape.

- **Carotid canal**—The carotid canal is a zig-zag shaped tunnel that provides passage through the base of the skull for one of the major arteries that supplies the brain. Its entrance is located on the outside base of the skull, anteromedial to the styloid process. The canal then runs anteromedially within the bony base of the skull, and then turns upward to its exit in the floor of the middle cranial cavity, above the foramen lacerum.

FRONTAL BONE

The **frontal bone** is the single bone that forms the forehead. At its anterior midline, between the eyebrows, there is a slight depression called the **glabella** (see [Figure 7.5](#)). The frontal bone also forms the supraorbital margin of the orbit. Near the middle of this margin, is the supraorbital foramen, the opening that provides passage for a sensory nerve to the forehead. The frontal bone is thickened just above each supraorbital margin, forming rounded brow ridges. These are located just behind your eyebrows and vary in size among individuals, although they are generally larger in males. Inside the cranial cavity, the frontal bone extends posteriorly. This flattened region forms both the roof of the orbit below and the floor of the anterior cranial cavity above (see [Figure 7.8b](#)).

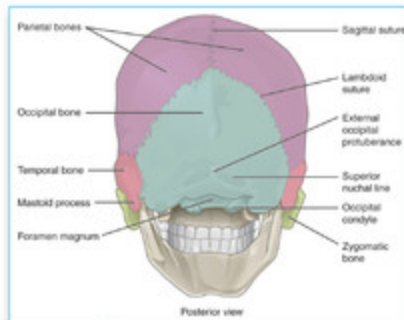


Figure 7.9

Posterior View of Skull: This view of the posterior skull shows attachment sites for muscles and joints that support the skull.

OCCIPITAL BONE

The **occipital bone** is the single bone that forms the posterior skull and posterior base of the cranial cavity ([Figure 7.9](#); see also [Figure 7.8](#)). On its outside surface, at the posterior midline, is a small protrusion called the

344

Table 11.4

Muscles of the Lower Jaw

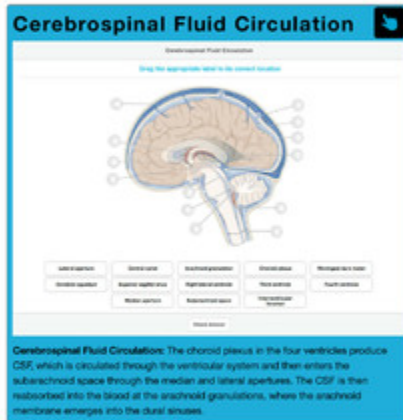
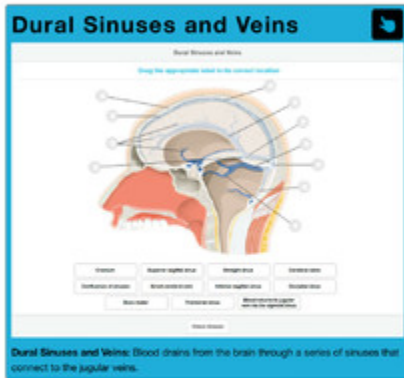
Movement	Target	Target motion direction	Prime mover	Origin	Insertion
Closes mouth; aids chewing	Mandible	Superior (elevates)	Masseter	Maxilla arch; zygomatic arch (for masseter)	Mandible
Closes mouth; pulls lower jaw in under upper jaw	Mandible	Superior (elevates); posterior (retracts)	Temporalis	Temporal bone	Mandible
Opens mouth; pushes lower jaw out under upper jaw; moves lower jaw side-to-side	Mandible	Inferior (depresses); posterior (protracts); lateral (abducts); medial (adducts)	Lateral pterygoid	Pterygoid process of sphenoid bone	Mandible
Closes mouth; pushes lower jaw out under upper jaw; moves lower jaw side-to-side	Mandible	Superior (elevates); posterior (protracts); lateral (abducts); medial (adducts)	Medial pterygoid	Sphenoid bone; maxilla	Mandible; temporomandibular joint

MUSCLES THAT MOVE THE TONGUE

Although the tongue is obviously important for tasting food, it is also necessary for mastication, **deglutition** (swallowing), and speech ([Figure 11.10](#) and [Figure 11.11](#)). Because it is so moveable, the tongue facilitates complex speech patterns and sounds.

Tongue muscles can be extrinsic or intrinsic. Extrinsic tongue muscles insert into the tongue from outside origins, and the intrinsic tongue muscles insert into the tongue from origins within it. The extrinsic muscles move the whole tongue in different directions, whereas the intrinsic muscles allow the tongue to change its shape (such as, curling the tongue in a loop or flattening it).

605



Sample

Try a sample of the upcoming [editable iBook](#), customizable in iBooks Author.